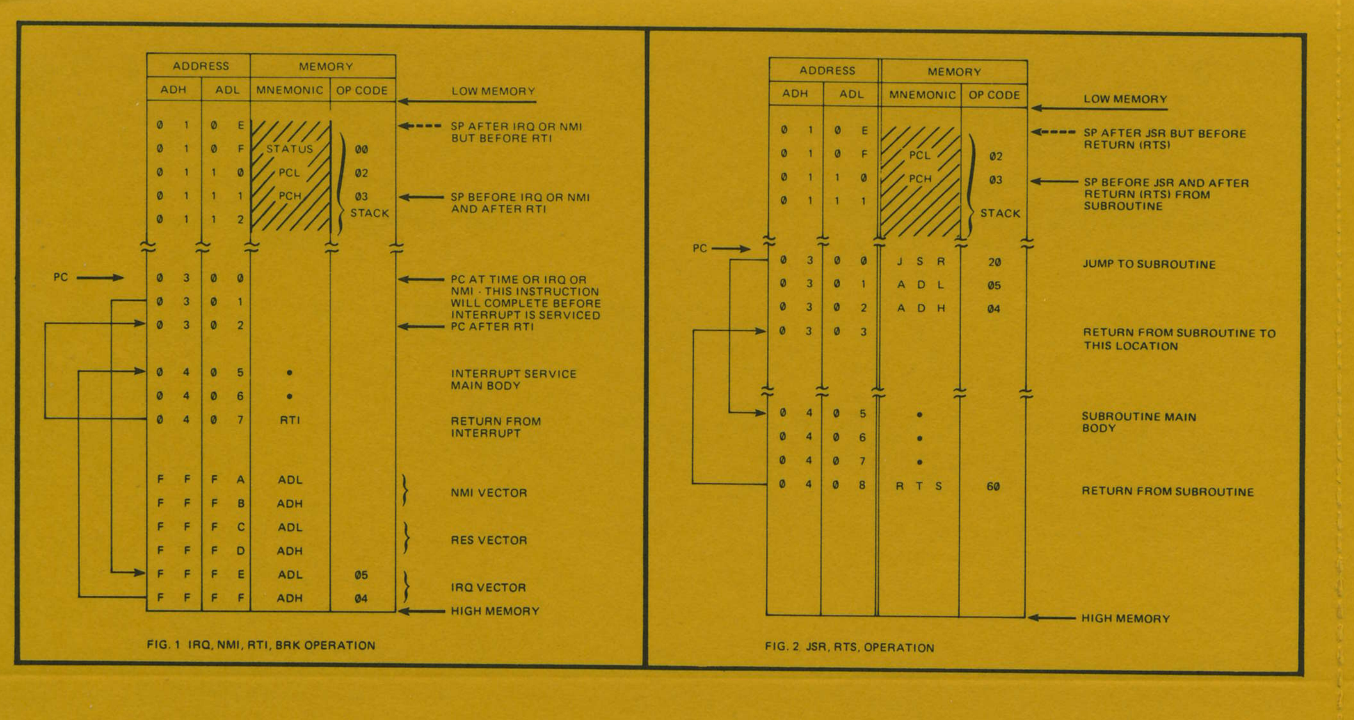


FIG. 1 IRQ, NMI, RTI, BRK OPERATION

FIG. 2 JSR, RTS, OPERATION

## ASSEMBLER DIRECTIVES

- OPT – SPECIFIES OPTIONS FOR ASSEMBLY
  OPTIONS ARE: (OPTIONS LISTED FIRST ARE THE DEFAULT VALUES).
  NOC (COU OR CNT) – DO NOT LIST ALL INSTRUCTIONS AND THEIR USAGE.
  NOG (GEN) – DO NOT GENERATE MORE THAN ONE LINE OF CODE FOR ASCII STRINGS.
  XRE (NOX) – PRODUCE A CROSS-REFERENCE LIST IN THE SYMBOL TABLE.
  ERR (NOE) – CREATE AN ERROR FILE.
  MEM (NOM) – CREATE AN ASSEMBLER OBJECT OUTPUT FILE.
  LIS (NOL) – PRODUCE A FULL ASSEMBLY LISTING.
- BYTE – PRODUCES A SINGLE BYTE IN MEMORY EQUAL TO EACH OPERAND SPECIFIED.
- WORD – PRODUCES AN ADDRESS (2 BYTES) IN MEMORY EQUAL TO EACH OPERAND SPECIFIED.
- DBYTE – PRODUCES TWO BYTES IN MEMORY EQUAL TO EACH OPERAND SPECIFIED.
- SKIP – GENERATE THE NUMBER OF BLANK LINES SPECIFIED BY THE OPERAND.
- PAGE – ADVANCE THE LISTING TO THE TOP OF A NEW PAGE AND CHANGE TITLE.
- END – DEFINES THE END OF A SOURCE PROGRAM.
  * = – DEFINES THE BEGINNING OF A NEW PROGRAM COUNTER SEQUENCE.

## LABELS

LABELS ARE THE FIRST FIELD AND MUST BE FOLLOWED BY AT LEAST ONE SPACE.
LABELS CAN BE UP TO 6 ALPHANUMERIC CHARACTERS LONG AND MUST BEGIN WITH AN ALPHA CHARACTER.
A,X,Y,S,P AND THE 56 OPCODES ARE RESERVED AND CANNOT BE USED AS LABELS.
LABEL = EXPRESSION CAN BE USED TO EQUATE LABELS TO VALUES.
LABEL *=* +N CAN BE USED TO RESERVE AREAS IN MEMORY.

## CHARACTERS USED AS SPECIAL PREFIXES:

- • INDICATES AN ASSEMBLER DIRECTIVE
- = SPECIFIES THE IMMEDIATE MODE OF ADDRESSING
- $ SPECIFIES A HEXADECIMAL NUMBER
- @ SPECIFIES AN OCTAL NUMBER
- % SPECIFIES A BINARY NUMBER
- ' SPECIFIES AN ASCII LITERAL CHARACTER
- ( ) INDICATES INDIRECT ADDRESSING
- ; INDICATES FOLLOWING TEXT ARE COMMENTS
- < SPECIFIES LOWER HALF OF A 16 BIT VALUE
- > SPECIFIES UPPER HALF OF A 16 BIT VALUE

## ASCII CHARACTER SET (7-BIT CODE)

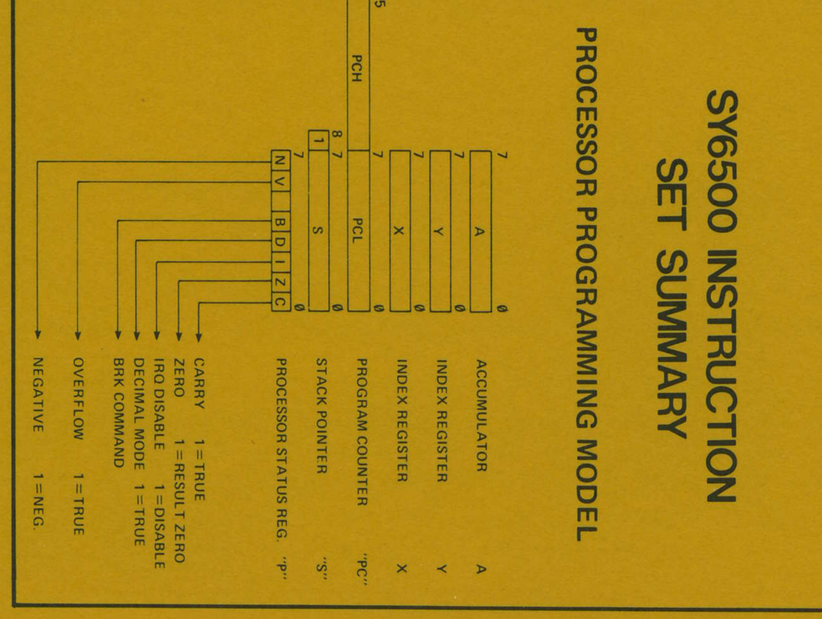
| LSD \ MSD | | 0<br>000 | 1<br>001 | 2<br>010 | 3<br>011 | 4<br>100 | 5<br>101 | 6<br>110 | 7<br>111 |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0000 | NUL | DLE | SP | 0 | @ | P | | p |
| 1 | 0001 | SOH | DC1 | ! | 1 | A | Q | a | q |
| 2 | 0010 | STX | DC2 | " | 2 | B | R | b | r |
| 3 | 0011 | ETX | DC3 | # | 3 | C | S | c | s |
| 4 | 0100 | EOT | DC4 | $ | 4 | D | T | d | t |
| 5 | 0101 | ENG | NAK | % | 5 | E | U | e | u |
| 6 | 0110 | ACK | SYN | & | 6 | F | V | f | v |
| 7 | 0111 | BEL | ETB | ' | 7 | G | W | g | w |
| 8 | 1000 | BS | CAN | ( | 8 | H | X | h | x |
| 9 | 1001 | HT | EM | ) | 9 | I | Y | i | y |
| A | 1010 | LF | SUB | * | : | J | Z | j | z |
| B | 1011 | VT | ESC | + | ; | K | [ | k | |
| C | 1100 | FF | FS | , | < | L | \ | l | \| |
| D | 1101 | CR | GS | — | = | M | ] | m | |
| E | 1110 | SO | RS | • | > | N | ↑ | n | ~ |
| F | 1111 | SI | VS | / | ? | O | ← | o | DEL |




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A Warner Communications Company

# SY6500 INSTRUCTION SET SUMMARY

## PROCESSOR PROGRAMMING MODEL






C016892 Rev. 1

| INSTRUCTIONS | | IMMEDIATE | | | ABSOLUTE | | | ZERO PAGE | | | ACCUM | | | IMPLIED | | | (IND, X) | | | (IND), Y | | | Z, PAGE X | | | ABS, X | | | ABS, Y | | | RELATIVE | | | INDIRECT | | | Z, PAGE, Y | | | CONDITION CODES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MNEMONIC | OPERATION | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | N | Z | C | I | D | V |
| ADC | A + M + C → A (4) (1) | 69 | 2 | 2 | 6D | 4 | 3 | 65 | 3 | 2 | | | | | | | 61 | 6 | 2 | 71 | 5 | 2 | 75 | 4 | 2 | 7D | 4 | 3 | 79 | 4 | 3 | | | | | | | | | | ✓ | ✓ | ✓ | – | – | ✓ |
| AND | A ∧ M → A (1) | 29 | 2 | 2 | 2D | 4 | 3 | 25 | 3 | 2 | | | | | | | 21 | 6 | 2 | 31 | 5 | 2 | 35 | 4 | 2 | 3D | 4 | 3 | 39 | 4 | 3 | | | | | | | | | | ✓ | ✓ | – | – | – | – |
| ASL | C ← [7 0] ← Ø | | | | ØE | 6 | 3 | Ø6 | 5 | 2 | ØA | 2 | 1 | | | | | | | | | | 16 | 6 | 2 | 1E | 7 | 3 | | | | | | | | | | | | | ✓ | ✓ | ✓ | – | – | – |
| BCC | BRANCH ON C=Ø (2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 9Ø | 2 | 2 | | | | | | | – | – | – | – | – | – |
| BCS | BRANCH ON C=1 (2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | BØ | 2 | 2 | | | | | | | – | – | – | – | – | – |
| BEQ | BRANCH ON Z=1 (2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | FØ | 2 | 2 | | | | | | | – | – | – | – | – | – |
| BIT | A ∧ M | | | | 2C | 4 | 3 | 24 | 3 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | $M_7$ | ✓ | – | – | – | $M_6$ |
| BMI | BRANCH ON N=1 (2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3Ø | 2 | 2 | | | | | | | – | – | – | – | – | – |
| BNE | BRANCH ON Z=Ø (2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | DØ | 2 | 2 | | | | | | | – | – | – | – | – | – |
| BPL | BRANCH ON N=Ø (2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1Ø | 2 | 2 | | | | | | | – | – | – | – | – | – |
| BRK | (See Fig. 1) | | | | | | | | | | | | | ØØ | 7 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | – | – | – | – | – | – |
| BVC | BRANCH ON V=Ø (2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 5Ø | 2 | 2 | | | | | | | – | – | – | – | – | – |
| BVS | BRANCH ON V=1 (2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 7Ø | 2 | 2 | | | | | | | – | – | – | – | – | – |
| CLC | Ø → C | | | | | | | | | | | | | 18 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | – | – | Ø | – | – | – |
| CLD | Ø → D | | | | | | | | | | | | | D8 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | – | – | – | – | Ø | – |
| CLI | Ø → I | | | | | | | | | | | | | 58 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | – | – | – | Ø | – | – |
| CLV | Ø → V | | | | | | | | | | | | | B8 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | – | – | – | – | – | Ø |
| CMP | A-M (1) | C9 | 2 | 2 | CD | 4 | 3 | C5 | 3 | 2 | | | | | | | C1 | 6 | 2 | D1 | 5 | 2 | D5 | 4 | 2 | DD | 4 | 3 | D9 | 4 | 3 | | | | | | | | | | ✓ | ✓ | ✓ | – | – | – |
| CPX | X-M | EØ | 2 | 2 | EC | 4 | 3 | E4 | 3 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | – | – | – |
| CPY | Y-M | CØ | 2 | 2 | CC | 4 | 3 | C4 | 3 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | ✓ | – | – | – |
| DEC | M-1 → M | | | | CE | 6 | 3 | C6 | 5 | 2 | | | | | | | | | | | | | D6 | 6 | 2 | DE | 7 | 3 | | | | | | | | | | | | | ✓ | ✓ | – | – | – | – |
| DEX | X-1 → X | | | | | | | | | | | | | CA | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | – | – | – | – |
| DEY | Y-1 → Y | | | | | | | | | | | | | 88 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | – | – | – | – |
| EOR | A ∀ M → A (1) | 49 | 2 | 2 | 4D | 4 | 3 | 45 | 3 | 2 | | | | | | | 41 | 6 | 2 | 51 | 5 | 2 | 55 | 4 | 2 | 5D | 4 | 3 | 59 | 4 | 3 | | | | | | | | | | ✓ | ✓ | – | – | – | – |
| INC | M + 1 → M | | | | EE | 6 | 3 | E6 | 5 | 2 | | | | | | | | | | | | | F6 | 6 | 2 | FE | 7 | 3 | | | | | | | | | | | | | ✓ | ✓ | – | – | – | – |
| INX | X + 1 → X | | | | | | | | | | | | | E8 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | – | – | – | – |
| INY | Y + 1 → Y | | | | | | | | | | | | | C8 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | – | – | – | – |
| JMP | JUMP TO NEW LOC | | | | 4C | 3 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 6C | 5 | 3 | | | | – | – | – | – | – | – |
| JSR | (See Fig. 2) JUMP SUB | | | | 2Ø | 6 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | – | – | – | – | – | – |
| LDA | M → A (1) | A9 | 2 | 2 | AD | 4 | 3 | A5 | 3 | 2 | | | | | | | A1 | 6 | 2 | B1 | 5 | 2 | B5 | 4 | 2 | BD | 4 | 3 | B9 | 4 | 3 | | | | | | | | | | ✓ | ✓ | – | – | – | – |

| | | IMMEDIATE | | | ABSOLUTE | | | ZERO PAGE | | | ACCUM. | | | IMPLIED | | | (IND, X) | | | (IND), Y | | | Z, PAGE, X | | | ABS, X | | | ABS, Y | | | RELATIVE | | | INDIRECT | | | Z, PAGE, Y | | | CONDITION CODES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MNEMONIC | OPERATION | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | OP | N | # | N | Z | C | I | D | V |
| LDX | M → X (1) | A2 | 2 | 2 | AE | 4 | 3 | A6 | 3 | 2 | | | | | | | | | | | | | | | | | | | BE | 4 | 3 | | | | | | | B6 | 4 | 2 | ✓ | ✓ | – | – | – | – |
| LDY | M → Y (1) | AØ | 2 | 2 | AC | 4 | 3 | A4 | 3 | 2 | | | | | | | | | | | | | B4 | 4 | 2 | BC | 4 | 3 | | | | | | | | | | | | | ✓ | ✓ | – | – | – | – |
| LSR | Ø → [7 0] → C | | | | 4E | 6 | 3 | 46 | 5 | 2 | 4A | 2 | 1 | | | | | | | | | | 56 | 6 | 2 | 5E | 7 | 3 | | | | | | | | | | | | | Ø | ✓ | ✓ | – | – | – |
| NOP | NO OPERATION | | | | | | | | | | | | | EA | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | – | – | – | – | – | – |
| ORA | A V M → A | Ø9 | 2 | 2 | ØD | 4 | 3 | Ø5 | 3 | 2 | | | | | | | Ø1 | 6 | 2 | 11 | 5 | 2 | 15 | 4 | 2 | 1D | 4 | 3 | 19 | 4 | 3 | | | | | | | | | | ✓ | ✓ | – | – | – | – |
| PHA | A → Ms S-1 → S | | | | | | | | | | | | | 48 | 3 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | – | – | – | – | – | – |
| PHP | P → Ms S-1 → S | | | | | | | | | | | | | Ø8 | 3 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | – | – | – | – | – | – |
| PLA | S + 1 → S Ms → A | | | | | | | | | | | | | 68 | 4 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | – | – | – | – |
| PLP | S + 1 → S Ms → P | | | | | | | | | | | | | 28 | 4 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | (RESTORED) | | | | | |
| ROL | ← [7 0] ← [C] ← | | | | 2E | 6 | 3 | 26 | 5 | 2 | 2A | 2 | 1 | | | | | | | | | | 36 | 6 | 2 | 3E | 7 | 3 | | | | | | | | | | | | | ✓ | ✓ | ✓ | – | – | – |
| ROR | → [C] → [7 0] → | | | | 6E | 6 | 3 | 66 | 5 | 2 | 6A | 2 | 1 | | | | | | | | | | 76 | 6 | 2 | 7E | 7 | 3 | | | | | | | | | | | | | ✓ | ✓ | ✓ | – | – | – |
| RTI | (See Fig. 1) RTRN INT. | | | | | | | | | | | | | 4Ø | 6 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | RESTORED) | | | | | |
| RTS | (See Fig. 2) RTRN SUB | | | | | | | | | | | | | 6Ø | 6 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | – | – | – | – | – | – |
| SBC | A-M-C̄ → A (1) | E9 | 2 | 2 | ED | 4 | 3 | E5 | 3 | 2 | | | | | | | E1 | 6 | 2 | F1 | 5 | 2 | F5 | 4 | 2 | FD | 4 | 3 | F9 | 4 | 3 | | | | | | | | | | ✓ | ✓ | (3) | – | – | ✓ |
| SEC | 1 → C | | | | | | | | | | | | | 38 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | – | – | 1 | – | – | – |
| SED | 1 → D | | | | | | | | | | | | | F8 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | – | – | – | – | 1 | – |
| SEI | 1 → I | | | | | | | | | | | | | 78 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | – | – | – | 1 | – | – |
| STA | A → M | | | | 8D | 4 | 3 | 85 | 3 | 2 | | | | | | | 81 | 6 | 2 | 91 | 6 | 2 | 95 | 4 | 2 | 9D | 5 | 3 | 99 | 5 | 3 | | | | | | | | | | – | – | – | | | |
| STX | X → M | | | | 8E | 4 | 3 | 86 | 3 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 96 | 4 | 2 | – | – | – | – | – | – |
| STY | Y → M | | | | 8C | 4 | 3 | 84 | 3 | 2 | | | | | | | | | | | | | 94 | 4 | 2 | | | | | | | | | | | | | | | | – | – | – | – | – | |
| TAX | A → X | | | | | | | | | | | | | AA | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | – | – | – | – |
| TAY | A → Y | | | | | | | | | | | | | A8 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | – | – | – | – |
| TSX | S → X | | | | | | | | | | | | | BA | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | – | – | – | – |
| TXA | X → A | | | | | | | | | | | | | 8A | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | – | – | – | – |
| TXS | X → S | | | | | | | | | | | | | 9A | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | – | – | – | – | – | – |
| TYA | Y → A | | | | | | | | | | | | | 98 | 2 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | ✓ | ✓ | – | – | – | – |

(1) ADD 1 TO "N" IF PAGE BOUNDARY IS CROSSED
(2) ADD 1 TO "N" IF BRANCH OCCURS TO SAME PAGE
ADD 2 TO "N" IF BRANCH OCCURS TO DIFFERENT PAGE
(3) CARRY NOT = BELOW
(4) IF IN DECIMAL MODE Z FLAG IS INVALID
ACCUMULATOR MUST BE CHECKED FOR ZERO RESULT

X INDEX X
Y INDEX Y
A ACCUMULATOR
M MEMORY PER EFFECTIVE ADDRESS
Ms MEMORY PER STACK POINTER

\+ ADD
– SUBTRACT
∧ AND
V OR
∀ EXCLUSIVE OR

– NOT MODIFIED
$M_7$ MEMORY BIT 7
$M_6$ MEMORY BIT 6
N NO. CYCLES
# NO. BYTES

✓ MODIFIED

## OP-CODE TABLE

| LSD / MSD | Ø | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F | LSD / MSD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ø | BRK | ORA-IND, X | | | | ORA-Z, Page | ASL-Z, PAGE | | PHP | ORA-IMM | ASL-A | | | ORA-ABS | ASL-ABS | | Ø |
| 1 | BPL | ORA-IND, Y | | | | ORA-Z, Page, X | ASL-Z, Page, X | | CLC | ORA-ABS, Y | | | | ORA-ABS, X | ASL-ABS, X | | 1 |
| 2 | JSR | AND-IND, X | | | BIT-Z, Page | AND-Z, Page | ROL-Z, Page | | PLP | AND-IMM | ROL-A | | BIT-ABS | AND-ABS | ROL-ABS | | 2 |
| 3 | BMI | AND-IND, Y | | | | AND-Z, Page, X | ROL-Z, Page, X | | SEC | AND-ABS, Y | | | | AND-ABS, X | ROL-ABS, X | | 3 |
| 4 | RTI | EOR-IND, X | | | | EOR-Z, Page | LSR-Z, Page | | PHA | EOR-IMM | LSR-A | | JMP-ABS | EOR-ABS | LSR-ABS | | 4 |
| 5 | BVC | EOR-IND, Y | | | | EOR-Z, Page, X | LSR-Z, Page, X | | CLI | EOR-ABS, Y | | | | EOR-ABS, X | LSR-ABS, X | | 5 |
| 6 | RTS | ADC-IND, X | | | | ADC-Z, Page | ROR-Z, Page | | PLA | ADC-IMM | ROR-A | | JMP-IND | ADC-ABS | ROR-ABS | | 6 |
| 7 | BVS | ADC-IND, Y | | | | ADC-Z, Page, X | | | SEI | ADC-ABS, Y | | | | ADC-ABS, X | | | 7 |
| 8 | | STA-IND, X | | | STY-Z, Page | STA-Z, Page | STX-Z, Page | | DEY | | TXA | | STY-ABS | STA-ABS | STX-ABS | | 8 |
| 9 | BCC | STA-IND, Y | | | STY-Z, Page, X | STA-Z, Page, X | STX-Z, Page, Y | | TYA | STA-ABS, Y | TXS | | | STA-ABS, X | | | 9 |
| A | LDY-IMM | LDA-IND, X | LDX-IMM | | LDY-Z, Page | LDA-Z, Page | LDX-Z, Page | | TAY | LDA-IMM | TAX | | LDY-ABS | LDA-ABS | LDX-ABS | | A |
| B | BCS | LDA-IND, Y | | | LDY-Z, Page, X | LDA-Z, Page, X | LDX-Z, Page, Y | | CLV | LDA-ABS, Y | TSK | | LDY-ABS, X | LDA-ABS, X | LDX-ABS, Y | | B |
| C | CPY-IMM | CMP-IND, X | | | CPY-Z, Page | CMP-Z, Page | DEC-Z, Page | | INV | CMP-IMM | DEX | | CPY-ABS | CMP-ABS | DEC-ABS | | C |
| D | BNE | CMP-IND, Y | | | | CMP-Z, Page, X | DEC-Z, Page, X | | CLD | CMP-ABS, Y | | | | CMP-ABS, X | DEC-ABS, X | | D |
| E | CPX-IMM | SBC-IND, X | | | CPX-Z, Page | SBC-Z, Page | INC-Z, Page | | INX | SBC-IMM | NOP | | CPX-ABS | SBC-ABS | INC-ABS | | E |
| F | BEQ | SBC-IND, Y | | | | SBC-Z, Page, X | INC-Z, Page, X | | SED | SBC-ABS, Y | | | | SBC-ABS, X | INC-ABS, X | | F |

IMM - IMMEDIATE ADDRESSING – THE OPERAND IS CONTAINED IN THE SECOND BYTE OF THE INSTRUCTION.

ABS - ABSOLUTE ADDRESSING – THE SECOND BYTE OF THE INSTRUCTION CONTAINS THE 8 LOW ORDER BITS OF THE EFFECTIVE ADDRESS. THE THIRD BYTE CONTAINS THE 8 HIGH ORDER BITS OF THE EFFECTIVE ADDRESS.

Z. PAGE - ZERO PAGE ADDRESSING – SECOND BYTE CONTAINS THE 8 LOW ORDER BITS OF THE EFFECTIVE ADDRESS. THE 8 HIGH ORDER BITS ARE ZERO.

A. - ACCUMULATOR – ONE BYTE INSTRUCTION OPERATING ON THE ACCUMULATOR.

Z. PAGE, X - Z PAGE, Y - ZERO PAGE INDEXED – THE SECOND BYTE OF THEINSTRUCTION IS ADDED TO THE INDEX (CARRY IS DROPPED) TO FORM THE LOW ORDER BYTE OF THE EA. THE HIGH ORDER BYTE OF THE EA IS ZEROS.

ABS, X ABS, Y ABSOLUTE INDEXED – THE EFFECTIVE ADDRESS IS FORMED BY ADDING THE INDEX TO THE SECOND AND THIRD BYTE OF THE INSTRUCTION.

(IND, X) - INDEXED INDIRECT – THE SECOND BYTE OF THE INSTRUCTION IS ADDED TO THE X INDEX, DISCARDING THE CARRY. THE RESULTS POINTS TO A LOCATION ON PAGE ZERO WHICH CONTAINS THE 8 LOW ORDER BITS OF THE EA. THE NEXT BYTE CONTAINS THE 8 HIGH ORDER BITS.

(IND), Y - INDIRECT INDEXED – THE SECOND BYTE OF THE INSTRUCTION POINTS TO A LOCATION IN PAGE ZERO. THE CONTENTS OF THIS MEMORY LOCATION IS ADDED TO THE Y INDEX, THE RESULT BEING THE LOW ORDER EIGHT BITS OF THE EA. THE CARRY FROM THIS OPERATION IS ADDED TO THE CONTENTS OF THE NEXT PAGE ZERO LOCATION, THE RESULTS BEING THE 8 HIGH ORDER BITS OF THE EA.